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brain of the Gorilla, Chimpanzee and Orang has been carefully studied in place, and where measurements of the brain have been controlled by measurements of the cranial capacity and relations—in short, wherever the best and only reliable methods have been employed, the cerebellum has been found covered by the cerebrum. My own observations are the following: 1st. The dissection of an infant Chimpanzee (two years) and the study of the relations in the fresh state in presence of several professors of anatomy at the New York Medical Schools, as well as of neurologists. I need instance but two eye-witnesses, Professors Wm. H. Darling and Wm. A. Hammond. 2d. The dissection of a large Chimpanzee (probably nine years old) and the verifying of the complete concealment of the cerebellum in the fresh specimen, in presence of Professor Herman Dörner, Ph.D., and several of my class in comparative anatomy. The hardened brain shows the same relation as it did in the fresh state. 3d. The cast of the skull of a Chimpanzee which I purchased many years ago. 4th. The examination of another out of which the brain had been removed by a coroner (!) at Coney Island.

As regards my Orang Outang I would say that in the median line the cerebellum was markedly overlapped, but that towards the sides its margin coincided with that of the cerebral edge. This is due to the altogether different shape of the Orang's cerebellum as contrasted with that of the Chimpanzee. Its lateral lobes flare out and do not taper like the human and troglodyte cerebellum.

In conclusion, I would say that I have observed a fifth ventricle (*ventriculus septi pellucidi*) in the Orang and Chimpanzee. I should be much interested to know whether Dr. Chapman has examined into this point and whether he confirms my observation or not. Judging from the photograph of the medial surface of a Gorilla's hemisphere in Pausch's monograph, I believe this species to correspond to other anthropoid apes in this regard.

The olivary nucleus is far richer in crenulations and mass in the Orang than in the Chimpanzee.

E. C. SPITZKA, M.D.

130 East 50th Street, Dec. 22, 1880.

To the Editor of SCIENCE:

For some years past I have been a strong believer in the anatomical uses of the cat as a standard of comparison for other vertebrates. I am persuaded, as the result of experience and observation, that the cat is a valuable and convenient subject of preliminary dissection by the human anatomist. I have often desired a description of the muscles in a cheaper and more convenient form than the ponderous quarto of Straus-Durckheim.

The forthcoming "Laboratory Manual," by Professors Wilder and Gage, of Cornell University, will contain detailed descriptions of the muscles of the neck and the arm, with explicit directions for the exposure and the dissection of each in its natural order. A most desirable feature of the manual is the Synonymy and General Description of the muscles.

This manual has been prepared by practical instructors and is not a mere compilation. At the request of Dr. Wilder, I have recently made some dissections for the sake of verifying the accuracy of these descriptions, as given in the advanced sheets printed for the students in his laboratory, and I am informed that duplicate sets of these sheets may be obtained, at a nominal price, by others who will engage to return the extra copy with criticisms and suggestions which may aid the authors in making the work more accurate and complete.

T. B. STOWELL.

STATE NORMAL SCHOOL, CORTLAND, N. Y.,
December 22, 1880.

ASTRONOMY.

THE TEMPEL-SWIFT COMET.

Professor Frisby, of the Naval Observatory, has computed from the Washington observations of October 25, November 7, and November 20, an orbit of the comet discovered by Mr. Swift on October 10, without assuming a value of the eccentricity or of the period, and finds an elliptic orbit with a periodic time of a little less than six years. The observations used in this calculation are too near together to give a good determination of the periodic time, but the probability is that this comet has made two revolutions around the sun since its discovery by Mr. Tempel in 1869, and that its true period is nearly $5\frac{1}{2}$ years. The perihelion distance found by Professor Frisby is 1069; and the aphelion distance is 5472. Thus one of these distances corresponds very nearly to the earth's distance from the sun, and the other to that of Jupiter.

This comet was observed at Washington on December 22 and 24, and data are at hand, therefore, for a more exact determination of the orbit. Since December 24 the sky has been cloudy.

A. HALL.

WASHINGTON, December 29, 1880.

COMET DISCOVERED.

The Smithsonian Institution has received from the Astronomer Royal, of England, the announcement of the discovery by Cooper on December 21, at nine o'clock P. M., Greenwich mean time, of a bright comet in 1 hour 5 minutes right ascension and 6 degrees north declination, which, at seven o'clock, December 25, was in 1 hour 29 minutes right ascension and 2 degrees north declination.

WASHINGTON, Dec. 28, 1880.

ALVAN CLARK & SONS, of Cambridgeport, have now on hand, in all the various stages of completion, a most interesting collection of large refractors, to say nothing of a number of glasses of 8 inches or less diameter.

The lenses of the 23-inch equatorial for Prof. Young, at Princeton, are receiving the finishing touches, and have already shown a remarkable degree of perfection. The glass was cast by Feil. The mounting for this instrument is well advanced.

A 16-inch objective for Prof. Swift, of the Warner Observatory, is finished, and the mounting nearly so. This glass is of English manufacture.

The McCormick glass of 26 inches aperture, made at the same time as the Washington Refractor, and intended for the University of Virginia, is still in the shop and has been completed for several years, while the mounting requires but comparatively little additional work.

Two 8-inch refractors have been ordered and are partially finished,—one ordered by Prof. Young for the seminary at South Hadley, and the other by Dr. Engelmann, of Leipsic.

The flint glass disc for the 30-inch telescope, ordered by Struve for the Russian Government, has been received from Feil, and the crown glass is expected shortly. The mounting for this will probably be made abroad.

For the Lick Trustees a 36-inch refractor is ordered, but will not be completed for several years.

A 12-inch equatorial for observing the transit of Venus is nearly finished, and orders have been received for a 5-inch photoheliograph and a smaller comet-seeker.

In all or nearly all of these instruments the cell of the object glass is arranged so as to separate the lenses by several inches and allow a free circulation of air between them, as well as to afford an opportunity of readily reaching the inner surfaces of the glass. In the larger objectives especially, such a device is required in order to bring the temperature of the glass as nearly as possible equal to that of the external air.

W. C. W.

To the Editor of "SCIENCE."

In view of Mr. A. N. Skinner's criticism of my attempted correction of certain dates of Prof. Watson's discoveries as given in "SCIENCE," p. 283, it seems perhaps due to all concerned to state how my note, p. 305, originated. Having occasion to learn the full extent of Prof. Watson's discoveries, I noticed that those of the dates given on p. 283 did not correspond with dates in Prof. Watson's own announcements of discoveries bearing the same serial numbers; and that Prof. Watson made no corrections of these announcements in the Journal which contains them. As the list, p. 283, was "compiled by the aid of the list of Minor Planets published by Mr. A. N. Skinner," in *Am. Jour. Sci.* III., xviii, and Mr. Skinner's list gives no dates, the inference was unavoidable that the dates were supplied by the compiler. Assuming this to be the editor, I noted down the discrepancies observed, sent the memorandum to the editor for his private use, and proceeded with my business. Had I been led to infer that the dates had been communicated from Washington, I should have exercised more caution. In any event, my memorandum was intended simply as a suggestion to the editor to re-examine the records; and it did not contain any reference to "your correspondent." Still more unfortunately, after deciding to publish my note, a change was made from "Aug. 16" to "Aug. 14," and this typographical error is one of the wrong dates which attracts Mr. Skinner's attention.

These misunderstandings have arisen from using my memorandum more conspicuously than was intended; and yet as it was not marked "private" or "personal," it cannot be insinuated that such use was unwarranted.

ALEXANDER WINCHELL.

UNIVERSITY OF MICHIGAN, ANN ARBOR, Dec. 27, 1880.

[NOTE.—We would remind Professor Winchell that the Astronomical Note which he attributed to the editor was signed, and dated from Washington, D. C. As to Professor Winchell's first letter, if it had been addressed personally to the editor, he would have been justified in using some discretion in regard to its publication, but a short note addressed to the "Editor of SCIENCE," directing attention to supposed errors in a previous number, seemed to demand immediate publication.

The suppression of the letter might have been interpreted adversely to the spirit in which this Journal is conducted, and as not conceding that respect for Professor Winchell's communications which is universally accorded in all scientific circles.

We think Professor Winchell has nothing to regret in writing the letter in question; the dates on which Professor Watson discovered the planets referred to, had clearly been mis-stated in several journals usually credited with exactness of statement. Professor Winchell's communication has directed attention to this fact, and we are glad that the correspondent who favors us with astronomical notes has been successful in correcting these errors in such a manner, and that their repetition is not probable in the future.—Ed.]

Prof. R. S. Ball, the Astronomer Royal for Ireland, delivered, recently, two lectures on the Life and Work of Sir W. Herschel, under the auspices of the Edinburgh Philosophical Institution. With the aid of large diagrams and the limelight he made his large audience conversant with the means adopted by Herschel in making his discoveries, and thoroughly impressed them with the magnitude of the labor. Speaking of Herschel's discovery that the sun was rapidly moving towards a point in the constellation Hercules, Prof. Ball said that at the end of the lecture his audience would be 5000 miles nearer to it than they were at the beginning.

THE ROYAL SOCIETY.

The following is the list of Officers and Council for the ensuing year:—

President—William Spottiswoode, M. A., D. C. L., LL. D.

Treasurer—John Evans, D. C. L., LL. D.

Secretaries—Professor George Gabriel Stokes, M. A., D. C. L., LL. D.; Professor Thomas Henry Huxley, LL. D.

Foreign Secretary—Professor Alexander William Williamson, Ph. D.

Other Members of the Council—William Henry Barlow, President, Inst. C. E.; Rev. Professor Thomas George Bonney, M. A., Secretary, G. S.; George Busk, F. L. S.; Right Hon. Sir Richard Asheton Cross, G. C. B.; Edwin Dunkin, V. P. R. A. S.; Alexander John Ellis, B. A.; Thomas Archer Hirst, Ph. D.; William Huggins, D. C. L., LL. D.; Professor John Marshall, F. R. C. S.; Professor Daniel Oliver, F. L. S.; Professor Alfred Newton, M. A., President C. P. S.; Professor William Odling, M. B., V.-P. C. S.; Henry Tibbatts Stainton, F. G. S.; Sir James Paget, Bart., D. C. L.; William Henry Perkin, Secretary C. S.; Lieut.-Gen. Richard Strachey, R. E., C. S. I.

CHEMICAL NOTES.

CHEMICAL CONSTITUENTS OF Stereocaulon Vesuvianum.—The question has been raised whether the succinic acid obtained from this lichen is a product of the decomposition of atranoric acid, which, however, on treatment with baryta, furnishes a product totally different.

DETECTION OF HONEY WITH STARCH-SUGAR.—A. Planta determines the grape-sugar present in honey before and after inversion. In pure honey the proportion of pre-existing grape-sugar is from 63 to 71, whilst in samples it is 29 to 37. But the starch-sugars of commerce contain a much higher proportion of pure grape-sugar than he assumes.

COLORIMETRIC DETERMINATION OF CHLORINE IN POTASSIUM BROMIDE.—One gm. potassium bromide is ground to a powder with an approximately equal quantity of potassium bichromate, placed in a flask holding 100 c.c. and covered with 5 c.c. concentrated sulphuric acid. The flask is then connected air-tight, by means of an adaptor ground to fit its mouth, with a receiver containing 100 c.c. very dilute ammonia (5 or 6 drops of caustic ammonia to 100 c.c. of water). A gentle heat is applied and raised to about 128°. There should be two large bulbs blown on the connection tube to prevent the reflux of the liquid. When all the chlorine has thus been expelled, the distillate is compared with solutions of ammonium chromate of known strength prepared for the purpose. C. ROTH.

SIMPLE METHOD FOR DETERMINING THE TEMPORARY HARDNESS OF WATER.—The most accurate method is to titrate at the boiling point, in a silver capsule with normal hydrochloric acid, using as indicator a solution of alizarin or extract of logwood. As a more convenient method when travelling, &c., A. Wartha uses a tube 30 to 40 cm. in length, closed and rounded at one end, and with a lower mark showing 10 c.c. From this mark, upwards towards the mouth, the tube is graduated in 0.1 of a c.c. For use, the tube is filled up to the lowest mark with the water in question and a little piece of filter-paper is added which has been previously saturated with extract of logwood and dried again. This gives the water a violet color. Centinormal hydrochloric acid is then added from a dropping bottle till the color of the liquid approaches an orange. The tube is then closed with the thumb and well shaken. Carbonic acid escapes and the liquid grows red again. Acid is again added, and the tube is again shaken till a single drop of acid changes the color of the liquid to a pure lemon yellow. The quantity of centinormal acid used is then read off on the graduated tube, and can be calculated into calcium carbonate.